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## (54) BEDDING FOR LIVESTOCK

LIEGEPLATZ FÜR VIEH

LITIERE POUR BETAIL

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## Description

**[0001]** This invention relates to bedding for livestock such as cattle and horses.

**[0002]** Ever since animal husbandry began in prehistoric times, farmers have recognised the importance of shelter and bedding in the comfort and well-being of their livestock. The predominant form of bedding has always been straw, largely in view of its ready availability to farmers who have historically obtained straw from their own land. It is, of course, also entirely possible to buy in straw from elsewhere; this option is becoming increasingly common.

**[0003]** In modern farming, straw bedding is typically spread in a thick layer upon a solid floor of concrete or stone in a suitable shelter. The shelter may, for example, house a covered straw yard, within which animals can congregate and move relatively freely, or rows of cubicles, within which animals are segregated side-by-side. The straw cushions the floor, affording warmth, support and hence comfort to a recumbent animal through the creation of an ergonomic shape corresponding to the shape and weight distribution of the animal. The straw also absorbs the animal's excreta in the form of faeces and urine and so, for reasons of hygiene, it must be removed and replaced with fresh straw after the animal has used the bedding for a few days.

**[0004]** Straw is a renewable natural resource that can be recycled after use by being spread onto and ploughed into fields, for example in addition to slurry including processed animal excreta washed from the animal shelter when the soiled straw is removed. However, renewing and recycling straw is expensive in view of the sheer volume of straw that is required to run a large farm. By way of illustration, the Inventor's herd of between three and four hundred cows incurs straw costs currently in excess of £40,000 per annum: well over £100 per cow per year.

**[0005]** The cost of the straw itself is not the only cost associated with the use of straw; the labour costs involved in handling straw before and after use, together with storage and transport costs before use and recycling costs after use, all militate against the use of straw.

**[0006]** In recent years, recycled rubber material has been used in the form of flexible matting as a component of animal bedding but this still requires the use of straw for cushioning purposes.

**[0007]** In view of these drawbacks, the Inventor has investigated other forms of animal bedding with the aim of finding bedding that does not employ straw and that has a fifteen- to twenty-year service life, and has alighted upon fluid-filled beds as an alternative to straw. His investigations have revealed that a fluid-filled bed has already been proposed specifically for the care of piglets, but that this prior proposal is deficient in several respects.

**[0008]** Specifically, a water bed for piglets is disclosed in a French patent application published in 1992 under the serial number 2,672,966 in the name of Galvelpor S.A.. In Galvelpor's patent application, the water bed comprises a labyrinthine channel of resilient tubes trough which heated water flows, the purpose of the labyrinth being to equalise temperature across the bed. The tubes lie upon a rigid insulating base in side-by-side disposition connected at their ends, and may be covered by a metal plate, for example of aluminium, so that the tubes will not be flattened (which would restrict the flow of water) or damaged if the bed is used for older and thus heavier animals.

**[0009]** Galvelpor's water bed would be quite unsuitable for use as bedding for livestock as a substitute for straw, even if it was scaled up in size. For instance, as the metal plate must be substantially rigid, the emphasis of Galvelpor's water bed is clearly upon heating rather than comfort. If the metal plate of Galvelpor's water bed is removed to expose the resilient upper surface defined by the tubes, it will be noted that the upper surface undulates in a series of valleys which would retain excreta to the detriment of comfort, cleaning and hygiene. Furthermore, as noted above, a heavy animal lying on the bed would flatten the tubes and prevent water flowing through them, thus undermining the heating effect that is the main purpose of Galvelpor's water bed and negating whatever supporting effect it may have.

**[0010]** Further, as Galvelpor's water bed requires a continuous flow of warm water, it requires inlet and drainage plumbing, suffers from high water consumption, and requires the maintenance of a minimum water pressure in the water supply.

**[0011]** NL-A-9201643 to Nooyen discloses a heated water bed intended to foster the well-being of piglets in a pig sty. The water bed lies on and conforms to the shape of a heating plate. It therefore appears that the water bed is largely flat, to the detriment of excreta removal, The water bed is of plastics material and is partially filled with foam plastics in an attempt to make the surface of the water bed more stable than it would be if filled only with water. Like Galvelpor, Nooyen's water bed is not suitable for the demands of heavy adult livestock.

**[0012]** FR-A-2690046 to Chollet discloses a fluid-filled mattress for preventing piglets being crushed under a sow within a farrowing stall, the mattress primarily acting as a barrier to prevent the piglets crawling under the sow when the sow is standing. To that end, the mattress inflates to a considerable depth when the sow stands up, so as to fill the gap beneath the sow's teats. It would appear that the mattress collapses completely when the sow lies down and so offers no support in the sense of a bed, despite Chollet's use of the term 'mattress'. So far as the sow is concerned, therefore, the only discernible or stated benefit of the mattress is that it prevents the sow's teats being grazed on the floor of the stall. A collapsed mattress is no different, as a bed, to the flexible matting acknowledged as prior art.

**[0013]** Furthermore, Chollet teaches away from an animal standing on a bed because the inflated mattress is too high to step onto; indeed, the sow straddles the inflated mattress when standing.

**[0014]** Chollet discloses a bed for livestock comprises a bladder expandable under internal fluid pressure acting upon at least one flexible supporting sheet defining a supporting area, such that when the bladder is expanded, the supporting sheet assumes a generally convex shape across the supporting area.

**[0015]** From one aspect, the invention is characterised with respect to Chollet in that the bladder is suitable for filling with fluid to cause the supporting sheet to curve into a shallow pillow-like shape, the fluid pressure being such that the point loading of a standing animal's foot presses the supporting sheet into frictional contact with a stable base whereas, when the animal lies down, fluid within the bladder is distributed such that substantially all pans of the animal's body are separated from the base by the fluid within the bladder.

**[0016]** The bed of the invention instils confidence in an animal by providing a secure footing, and the smoothly convex shape of the supporting sheet causes excreta and other fluids to flow off the bed.

**[0017]** The bladder may be situated between first and second flexible sheets laminated one above the other, at least one of which is the supporting sheet. This aspect of the invention provides a simple and effective form of construction. Whichever sheet lies upon the floor constitutes a stable base into which the supporting sheet can be pressed.

**[0018]** The or each supporting sheet suitably has a depressed marginal portion beside or around the supporting area, at which the or each supporting sheet may be bonded to a base or to each other. The depressed marginal portion can define a drainage channel to carry excreta off the bed.

**[0019]** For simplicity of construction, it is preferred that the bladder is at least partially defined by the or each supporting sheet, the supporting sheet thus being an impermeable wall of the bladder.

**[0020]** For reversibility and thus for a longer working life, the bed preferably comprises first and second supporting sheets which are substantially identical to one another. The or each supporting sheet may have a non-slip outer wearing surface to give animals a secure footing and thus the confidence to use the bed.

**[0021]** The or each supporting sheet is suitably of a rubberised belting material, which is preferably polyurethane-based for long life.

**[0022]** A pipe suitably communicates with the bladder to admit fluid to the bladder and a valve associated with the pipe can be set to prevent fluid flowing out of the bladder. When the valve is open, the same pipe may be used to drain fluid from the bladder.

**[0023]** In order that the bed can be adjusted to suit different animals of different sizes, it is preferred that the valve is adjustable to vary the water pressure within the bladder.

**[0024]** For the protection of animals lying on adjacent beds, a peripheral upstanding divider such as a batten is preferably situated at the aforementioned depressed marginal portion. Fastenings may extend from a divider through the sheets and into a floor on the other side of the bed.

**[0025]** The invention also encompasses an integral group of beds as defined above, connected together. For simplicity and ease of manufacture, the or each supporting sheet is preferably continuous across the group.

**[0026]** The beds can be disposed in various ways within the group, but it is preferred that the beds are disposed side-by-side to form an elongate strip. The strip can be rolled up into a relatively compact configuration for storage and transportation, to be unrolled upon installation.

**[0027]** Where the aforementioned dividers are used in a group of beds, adjacent beds are conveniently separated by a divider.

**[0028]** Each bed in a group preferably has an individual adjustable valve permitting the fluid pressure within its bladder to be varied independently of the fluid pressure in the other bladders within the group. Nevertheless, all of the bladders can be connected by a manifold to a common water supply.

**[0029]** The invention extends to a method for supporting livestock upon a bed or group of beds as defined above, comprising selecting a fluid pressure or fluid volume within the bladder appropriate to a particular animal such that the point loading of that animal's foot, when standing, will press the supporting sheet into frictional contact with a stable base whereas, when the animal lies down to spread the loading of its weight, fluid within the bladder will be distributed such that all or substantially all parts of the animal's body are separated from the base by the fluid within the bladder.

**[0030]** When applied to supporting a plurality of animals upon a group of beds, the method suitably comprises selecting a different fluid pressure within each bed of the group.

**[0031]** In order that this invention can be more readily understood, reference will now be made, by way of example, to the accompanying drawings. For the purposes of illustrating the invention with brevity, the description hereafter will refer to its preferred application as bedding for cows. It is to be understood, however, that the broad concept of the invention is not limited to use with cows but can encompass other livestock such as horses.

**[0032]** In the drawings:

Figure 1 is a top perspective view showing a preferred embodiment of the invention - an integral group of cow beds in the form of a strip - in a contracted state;

Figure 2 is a partial schematic longitudinal cross section of the strip of Figure 1;

Figure 3 is a top perspective view corresponding to Figure 1 but showing the cow beds in an expanded state;

Figure 4 is a partial schematic longitudinal cross section of the strip of Figure 3;

Figure 5 is a schematic transverse cross-section showing the cow bed when a cow stands upon it; and

Figure 6 is a schematic perspective view showing the cow bed when a cow lies upon it.

**[0033]** Referring firstly to Figure 1 of the drawings, a plurality of rectangular cow beds 10 are connected together in an integral group disposed side-by-side in a linear array to form an elongate rectangular strip 11. The strip 11 can be of any practical length determined by the number of beds 10 that it contains and by their individual dimensions. A preferred length for the strip 11 is approximately forty-five metres containing, for example, thirty-two beds 10 each about 1.4 metres across; the strip 11 itself is about 2.3 metres across, meaning that each bed 10 in this example has a total plan area of about 2.3 x 1.4 metres.

**[0034]** These measurements are not essential to the invention and can be varied for differently-sized cows - for example, a variant having beds 10 with an area of approximately 2.0 square metres is also contemplated - or indeed for different species of animal.

**[0035]** The strip 11 is designed for use within a shelter on a continuous floor shared by a row of cubicles (not shown). The strip 11 lies on the floor extending along the row of cubicles under the structures, such as stalls, that define the respective cubicles, and is so positioned that one bed 10 is aligned with each cubicle.

**[0036]** Referring now also to Figure 2 of the drawings, it will be seen that the strip 11 is a laminate of two flexible and impermeable sheets 12 which are bonded together around the margins 13 of each bed 10 by adhesives, such as mastic, or vulcanising to define a bladder 14 at the centre of each bed 10. The bladders 14 are shown in a contracted state in Figures 1 and 2. Each bed 10 also includes a pipe 15 of metal or plastics material bonded into and sealed to the strip 11. The pipe 15 communicates with the bladder 14 to admit water to, and to drain water from, the bladder 14 via a valve when desired.

**[0037]** The outer wearing surface of each sheet is somewhat rough to provide non-slip qualities. It will be noted that the sheets 12 are identical, allowing the strip 11 to be inverted in use to present a fresh wearing surface and thus to prolong the working life of the strip 11.

**[0038]** The beds 10 are separated by battens 16 that extend across the strip 11 terminating just short of the long edges 17 of the strip 11. Screws or bolts 18 extend through a batten 16 through the strip 11 and into a floor 19 on the other side of the strip 11. The battens 16 are preferably of hardwood and may, for example, be of 50 mm x 50 mm square cross-section.

**[0039]** As cows tend to lie down with at least their hind legs to one side, the battens 16 help to prevent the hooves of a cow lying on a bed 10 slipping across onto the adjacent bed 10 and possibly causing udder damage or other injury to a cow lying on the adjacent bed 10.

**[0040]** The sheets 12 are of a flexible synthetic rubberised belting material, preferably polyurethane-based, similar to the material used for moving walkways and other continuous belts. As such, the strip 11 can be rolled up for compact storage and easy transportation and is simply unrolled along the floor upon installation whereupon the strip 11 is held down by fastening the battens 16 to the floor 19 through the strip 11 by means of fastenings 18. This job requires only unskilled labour. The strip 11 can be lifted from the floor 19 by removing the battens 16 and rolled up after use with similar ease.

**[0041]** Referring now to Figures 3 and 4 of the drawings, the bladder 14 expands when water is introduced under pressure through the pipe 15, the lower sheet 12 bearing against the floor 19 to define a flat base and the upper sheet 12 curving into a convex shallow part-elliptical pillow-like shape (somewhat exaggerated in Figure 4).

**[0042]** Valves (not shown) associated with the pipes 15 prevent water flowing back out of the bladder 14 until it is desired to drain the bladder 14 after use. The valves are preferably adjustable so that the water pressure within the bladder 14 and thus its supporting ability can be adjusted to suit any weight of cow. It is further preferred that each bladder 14 has an individual adjustable valve so that the water pressure within a bladder 14 can be varied independently of the water pressure in the other bladders 14 within the strip 11, even if all of the bladders 14 are connected to a common water supply using a suitable manifold. In this way, the strip 11 can be used simultaneously by cows of substantially differing weights.

**[0043]** It is important that a bed 10 instils confidence in a cow which otherwise would be reluctant to use the bed 10. To this end, the bed 10 responds differently when a cow stands on the bed 10, as shown in Figure 5 of the drawings, to when a cow lies on the bed 10, as shown in Figure 6.

**[0044]** When a cow 20 first walks onto the bed 10 applying one or more of its hooves to the bed 10, as shown in Figure 5, before it eventually lies down, the high-pressure point loading of a hoof presses the upper sheet 12 firmly into frictional contact with the lower sheet 12 which therefore provides a stable footing between the hoof and the floor 19.

**[0045]** In contrast, when the cow 20 lies down as shown in Figure 6, the bulk of its body spreads the loading of its weight, re-distributing the water held within the bladder 14 to cause the upper sheet 12 to mould to the contours of the cow's body. The bladder 14 thus adopts a comfortably supporting configuration in which all or substantially all pans of the cow's body are separated from the floor 19 by a cushioning layer of water. Apart from its ergonomic characteristics and cushioning effect, the water-filled bladder 14 stores heat from the cow's body and insulates the cow 20 from the colder floor 19.

**[0046]** The comfort of the bed 10 derived from its cushioning and insulating effect means that there is no need to use straw, unlike the flexible matting of the prior art.

**[0047]** When the cow 20 stands up on the bed 10, the bed 10 assumes the state shown in Figure 5 for stability and then, when the cow 20 walks off the bed 10, the upper sheet 12 of the bed 10 reverts to the convex shape shown in Figure 4. The convex shape promotes the flow of fluids and excreta off the bed 10 under gravity, to the benefit of hygiene. This shaping and the impermeable material of the bed 10 thus make for easy cleaning; the bed 10 can simply be steam cleaned or hosed down occasionally after a cow has used it, the margins 13 defining drainage channels that lead the fluids and excreta into a slurry channel for further processing and storage.

**[0048]** It is envisaged that a suitable belting material will give a continuous working life of at least fifteen years, permitting a very substantial saving in straw costs while promoting the comfort and well-being, and reducing injury, of many animals during the life of the product.

**[0049]** Many variations are possible. For example, the beds need not be grouped together as described; they could be individual units, or the group could be arranged other than in a linear array.

**[0050]** Further, if the provisions for reversibility and rolling-up are not required, the beds may have a substantially rigid base. In this case, the base could even be integral with or formed by the floor of a shelter; the floor may, for example, be shaped to define a recess covered by a flexible sheet to define a bladder.

**[0051]** The battens are also merely an optional feature of the invention in its broadest sense; dividers other than battens are, of course, possible and may include integral formations moulded into or bonded to the bed.

**[0052]** Indeed, the present invention may be embodied in many other specific forms without departing from the scope of the appended claims.

## Claims

1. A bed (10) for livestock, the bed (10) comprising a bladder (14) expandable under internal fluid pressure acting upon at least one flexible supporting sheet (12) defining a supporting area, such that when the bladder (14) is expanded, the supporting sheet (12) assumes a generally convex shape across the supporting area, characterised in that the bladder (14) is suitable for filling with fluid to cause the supporting sheet (12) to curve into a shallow pillow-like shape, the fluid pressure being such that the point loading of a standing animal's foot (20) presses the supporting sheet (12) into frictional contact with a stable base (12) whereas, when the animal (20) lies down, fluid within the bladder (14) is distributed such that substantially all pans of the animal's body (20) are separated from the base (12) by the fluid within the bladder (14).

2. A bed (10) as defined in claim 1, wherein the bladder (14) is situated between first and second flexible sheets (12) laminated one above the other, at least one of which is the supporting sheet (12).

3. A bed (10) as defined in claim 2, wherein the first and second supporting sheets (12) are substantially identical to one another.

4. A bed (10) as defined in any preceding claim, wherein the or each supporting sheet (12) has a depressed marginal portion (13) beside or around the supporting area.

5. A bed (10) as defined in claim 4, wherein the or each supporting sheet (12) is bonded around the depressed marginal portion (13).

6. A bed (10) as defined in any preceding claim, wherein the bladder (14) is at least partially defined by the or each supporting sheet (12).

7. A bed (10) as defined in any preceding claim, wherein the or each supporting sheet (12) has a non-slip outer wearing surface.

8. A bed (10) as defined in any preceding claim, wherein the or each supporting sheet (12) is of a rubberised or plastics-based material.

9. A bed (10) as defined in any preceding claim, wherein a pipe (15) communicates with the bladder (14) to admit fluid to the bladder (14) and a valve associated with the pipe (15) is capable of preventing fluid flowing out of the bladder (14).

10. A bed (10) as defined in claim 9, wherein the pipe (15) is capable of draining fluid from the bladder (14).

11. A bed (10) as defined in claim 9 or claim 10, wherein the valve is adjustable to vary fluid pressure within the bladder (14).

12. A bed (10) as defined in any preceding claim and

having a peripheral upstanding divider (16) such as a batten (16).

13. A bed (10) as defined in claim 12 when appendant to claim 4, wherein the divider (16) is situated at the depressed marginal portion (13).

14. A bed (10) as defined in claim 13, wherein fastenings (18) extend from a divider (16) through the sheets (12) and into a floor supporting the bed (10).

15. A bed (10) for livestock, the bed (10) comprising a fluid-containing bladder (14) expanded under internal fluid pressure acting upon at least one flexible supporting sheet (12) defining a supporting area, the supporting sheet (12) thereby having a generally convex shape across the supporting area, characterised in that the supporting sheet (12) is curved into a shallow pillow-like shape and in that the fluid pressure is such that the point loading of a standing animal's foot (20) presses the supporting sheet (12) into frictional contact with a stable base (12) whereas, when the animal (20) lies down, fluid within the bladder (14) is distributed such that substantially all pans of the animal's body (20) are separated from the base (12) by the fluid within the bladder (14).

16. An integral group (11) of beds (10) as defined in any preceding claim, connected together.

17. A group (11) of beds (10) as defined in claim 16, wherein the or each supporting sheet (12) is continuous across the group (11).

18. A group (11) of beds (10) as defined in claim 16 or claim 17, wherein the beds (10) are disposed side-by-side to form an elongate strip (11).

19. A group (11) of beds (10) as defined in claim 18 containing beds (10) as defined in claim 2 or in any of claims 3 to 14 when appendant thereto, wherein the strip (11) can be rolled up into a relatively compact configuration.

20. A group (11) of beds (10) as defined in any of claims 16 to 19, wherein adjacent beds (10) are separated by at least one upstanding divider (16).

21. A group (11) of beds (10) as defined in any of claims 16 to 20, wherein each bed (10) has an individual adjustable valve permitting the fluid pressure within its bladder (14) to be varied independently of the fluid pressure in the other bladders (14) within the group (11).

22. A group (11) of beds (10) as defined in any of claims 16 to 21, wherein all of the bladders (14) are connected by a manifold to a common water supply.

23. A method of supporting livestock upon a bed (10) as defined in any of claims 1 to 15 or upon a group (11) of beds (10) as defined in any of claims 16 to 22, comprising selecting a fluid pressure or fluid volume within the bladder (14) appropriate to a particular animal (20) such that the point loading of that animal's foot (20), when standing, will press the supporting sheet (12) into frictional contact with a stable base (12) whereas, when the animal (20) lies down, fluid within the bladder (14) will be distributed such that substantially all parts of the animal's body (20) are separated from the base (12) by the fluid within the bladder (14).

24. The method as defined in claim 23 when applied to supporting a plurality of animals (20) upon a group (11) of beds (10) as defined in any of claims 16 to 22, comprising selecting a different fluid pressure within each bed (10) of the group (11).

**Patentansprüche**

1. Bett (10) für Vieh, wobei das Bett (10) einen Balg (14) aufweist, der unter einem inneren Fluiddruck expandierbar ist, der auf zumindest eine flexible Tragefläche (12) einwirkt, die einen Trageflächenbereich definiert, so daß dann, wenn der Balg (14) expandiert ist, die Tragefläche (12) eine im wesentlichen konvexe Form über dem Trageflächenbereich annimmt, dadurch gekennzeichnet, daß der Balg (14) zum Füllen mit einem Fluid geeignet ist, um zu bewirken, daß sich die Tragefläche (12) in eine flache, kissenähnliche Form wölbt, wobei der Fluiddruck derart ist, daß die Punktbelastung des Fußes (20) eines stehenden Tiers die Tragefläche (12) in reibungsmäßigen Kontakt mit einer stabilen Basis (12) drückt, wogegen dann, wenn das Tier (20) niederliegt, Fluid innerhalb des Balgs (14) derart verteilt wird, daß im wesentlichen alle Teile des Körpers (20) des Tiers von der Basis (12) durch das Fluid innerhalb des Balgs (14) getrennt sind.

2. Bett (10) nach Anspruch 1, wobei der Balg (14) zwischen der ersten und der zweiten flexiblen Fläche (12), laminiert eine über der anderen, liegt, wobei mindestens eine davon die Tragefläche (12) ist.

3. Bett (10) nach Anspruch 2, wobei die erste und die zweite Tragefläche (12) im wesentlichen identisch zueinander sind.

4. Bett (10) nach einem vorhergehenden Anspruch, wobei die oder jede Tragefläche (12) einen tiefliegenden Randbereich (13) neben dem oder um den Trageflächenbereich herum besitzt.

5. Bett (10) nach Anspruch 4, wobei die oder jede Tragefläche (12) um den tiefliegenden Randbereich (13) herum angebondet ist.

6. Bett (10) nach einem vorhergehenden Anspruch, wobei der Balg (14) mindestens teilweise durch die oder jede Tragefläche (12) definiert ist.

7. Bett (10) nach einem vorhergehenden Anspruch, wobei die oder jede Tragefläche (12) eine rutschfeste, äußere Gebrauchsoberfläche besitzt.

8. Bett (10) nach einem vorhergehenden Anspruch, wobei die oder jede Tragefläche (12) aus einem gummierten oder einem auf Kunststoff basierenden Material gebildet ist.

9. Bett (10) nach einem vorhergehenden Anspruch, wobei ein Rohr (15) mit dem Balg (14) kommuniziert, um Fluid zu dem Balg (14) einzulassen, und ein Ventil, das dem Rohr (15) zugeordnet ist, dazu geeignet ist, eine Fluidströmung aus dem Balg (14) heraus zu verhindern.

10. Bett (10) nach Anspruch 9, wobei das Rohr (15) geeignet ist, Fluid von dem Balg (14) ablaufen zu lassen.

11. Bett (10) nach Anspruch 9 oder Anspruch 10, wobei das Ventil so einstellbar ist, um einen Fluiddruck innerhalb des Balgs (14) zu variieren.

12. Bett (10) nach einem vorhergehenden Anspruch und das eine periphere, hochstehende Unterteilungseinrichtung (16), wie beispielsweie eine Leiste (16), besitzt.

13. Bett (10) nach Anspruch 12, in Abhängigkeit von Anspruch 4, wobei die Unterteilungseinrichtung (16) an dem tiefliegenden Randbereich (13) angeordnet ist.

14. Bett (10) nach Anspruch 13, wobei sich Befestigungseinrichtungen (18) von einer Unterteilungseinrichtung (16) durch die Flächen (12) und in einen Boden hinein, der das Bett (10) trägt, erstrekken.

15. Bett (10) für Vieh, wobei das Bett (10) einen Fluid enthaltenden Balg (14) aufweist, der unter innerem Fluiddruck expandiert ist, der auf mindestens eine flexible Tragefläche (12) einwirkt, die einen Trageflächenbereich definiert, wobei die Tragefläche (12) dadurch eine im wesentlichen konvexe Form über den Trageflächenbereich besitzt, dadurch gekennzeichnet, daß die Tragefläche (12) in eine flache, kissenähnliche Form gewölbt ist und daß der Fluiddruck derart ist, daß die Punktbelastung eines Fußes (20) eines stehenden Tiers die Tragefläche (12) in einen reibungsmäßigen Kontakt mit einer stabilen Basis (12) drückt, wogegen dann, wenn das Tier (20) niederliegt, Fluid innerhalb des Balgs (14) derart verteilt wird, daß im wesentlichen alle Teile des Körpers (20) des Tiers von der Basis (12) durch das Fluid innerhalb des Balgs (14) getrennt sind.

16. Integrale Gruppe (11) aus Betten (10), wie sie in einem vorhergenden Anspruch definiert sind, die miteinander verbunden sind.

17. Gruppe (11) aus Betten (10), wie sie in Anspruch 16 definiert ist, wobei die oder jede Tragefläche (12) über die Gruppe (11) hinweg fortlaufend ist.

18. Gruppe (11) aus Betten (10), wie sie in Anspruch 16 oder Anspruch 17 definiert ist, wobei die Betten (10) Seite an Seite angeordnet sind, um ein langgestrecktes Band (11) zu bilden.

19. Gruppe (11) aus Betten (10) nach Anspruch 18, die Betten (10) enthält, wie sie in Anspruch 2 oder in einem der Ansprüche 3 bis 14 definiert sind, wenn sie davon abhängig sind, wobei das Band (11) zu einer relativ kompakten Konfiguration aufgerollt werden kann.

20. Gruppe (11) aus Betten (10) nach einem der Ansprüche 16 bis 19, wobei benachbarte Betten (10) durch mindestens eine hochstehende Unterteilungseinrichtung (16) voneinander getrennt sind.

21. Gruppe (11) aus Betten (10) nach einem der Ansprüche 16 bis 20, wobei jedes Bett (10) ein individuelles, einstellbares Ventil besitzt, das ermöglicht, daß der Fluiddruck innerhalb dessen Balgs (14) unabhängig des Fluiddrucks in den anderen Bälgen (14) innerhalb der Gruppe (11) variiert werden kann.

22. Gruppe (11) aus Betten (10) nach einem der Ansprüche 16 bis 21, wobei alle Bälge (14) durch einen Verteiler mit einer gemeinsamen Wasserversorgung verbunden sind.

23. Verfahren zum Tragen von Vieh auf einem Bett (10), wie es in einem der Ansprüche 1 bis 15 definiert ist, oder auf einer Gruppe (11) aus Betten (10), wie sie in einem der Ansprüche 16 bis 22 definiert ist, das ein Auswählen eines Fluiddrucks oder eines Fluidvolumens innerhalb des Balgs (14) geeignet zu einem bestimmten Tier (20) aufweist derart, daß die Punktbelastung des Fußes (20) des Tiers, wenn es steht, die Tragefläche (12) in einen reibungsmäßigen Kontakt mit einer stabilen Basis (12) drücken wird, wogegen dann, wenn das Tier

(20) niederliegt, Fluid innerhalb des Balgs (14) derart verteilt werden wird, daß im wesentlichen alle Teile des Körpers (20) des Tiers von der Basis (12) durch das Fluid innerhalb des Balgs (14) getrennt werden.

**24.** Verfahren nach Anspruch 23, wenn es zum Tragen einer Vielzahl von Tieren (20) auf einer Gruppe (11) aus Betten (10), wie sie in einem der Ansprüche 16 bis 22 definiert ist, angewandt wird, das ein Auswählen eines unterschiedlichen Fluiddrucks innerhalb jedes Betts (10) der Gruppe (11) aufweist.

## Revendications

**1.** Litière (10) pour bétail, la litière (10) comprenant un réservoir souple (14) susceptible de se dilater sous la pression d'un fluide intérieur agissant sur au moins une feuille de support souple (12) définissant une zone de support, de telle sorte que, lorsque le réservoir souple (14) est dilaté, la feuille de support (12) prend une forme globalement convexe sur la zone de support, caractérisée en ce que le réservoir souple (14) est adapté pour être rempli de fluide afin de provoquer le gonflement de la feuille de support (12) qui prend une forme d'oreiller peu épais, la pression du fluide étant telle que la charge concentrée d'une patte d'animal debout (20) appuie sur la feuille de support (12) qui vient en contact par frottement avec une base stable (12) tandis que, lorsque l'animal est couché, le fluide contenu dans le réservoir souple (14) est réparti de telle sorte que sensiblement toutes les parties du corps de l'animal (20) soient isolées de la base (12) par le fluide contenu dans le réservoir souple (14).

**2.** Litière (10) selon la revendication 1, dans laquelle le réservoir souple (14) est placé entre des première et seconde feuilles souples (12) stratifiées l'une sur l'autre, dont au moins une est la feuille de support (12).

**3.** Litière (10) selon la revendication 2, dans laquelle les première et seconde feuilles de support (12) sont sensiblement identiques l'une à l'autre.

**4.** Litière (10) selon l'une quelconque des revendications précédentes, dans laquelle la ou chaque feuille de support (12) présente une portion marginale creuse (13) à côté de ou autour de la zone de support.

**5.** Litière (10) selon la revendication 4, dans laquelle la ou chaque feuille de support (12) est collée autour de la portion marginale creuse (13).

**6.** Litière (10) selon l'une quelconque des revendications précédentes, dans laquelle le réservoir souple (14) est au moins partiellement défini par la ou chaque feuille de support (12).

**7.** Litière (10) selon l'une quelconque des revendications précédentes, dans laquelle la ou chaque feuille de support (12) possède une surface d'habillage extérieur antidérapante.

**8.** Litière (10) selon l'une quelconque des revendications précédentes, dans laquelle la ou chaque feuille de support (12) est en matière caoutchouteuse ou à base de plastique.

**9.** Litière (10) selon l'une quelconque des revendications précédentes, dans laquelle un tuyau (15) communique avec le réservoir souple (14) pour envoyer du fluide dans le réservoir souple (14) et une valve associée au tuyau (15) est apte à empêcher le liquide de s'écouler hors du réservoir souple (14).

**10.** Litière (10) selon la revendication 9, dans laquelle le tuyau (15) est susceptible de drainer le fluide depuis le réservoir souple (14).

**11.** Litière (10) selon la revendication 9 ou la revendication 10, dans laquelle la valve est réglable pour faire varier la pression du fluide régnant à l'intérieur du réservoir souple (14).

**12.** Litière (10) selon l'une quelconque des revendications précédentes et ayant une séparation droite périphérique (16) telle qu'une latte (16).

**13.** Litière (10) selon la revendication 12, lorsqu'elle dépend de la revendication 4, dans laquelle la séparation (16) est placée au niveau de la portion marginale creuse (13).

**14.** Litière (10) selon la revendication 13, dans laquelle des fixations (18) s'étendent de la séparation (16) à travers les feuilles (12) et dans un plancher supportant la litière (10).

**15.** Litière (10) pour bétail, la litière (10) comprenant un réservoir souple (14) contenant un fluide, dilaté sous l'effet d'une pression de fluide agissant sur au moins une feuille de support souple (12) définissant une zone de support, la feuille de support (12) ayant ainsi une forme globalement convexe sur la zone de support, caractérisée en ce que la feuille de support (12) est gonflée en une forme d'oreiller peu épais et en ce que la pression du fluide est telle que la charge concentrée d'une patte d'animal debout (20) appuie sur la feuille de support (12) qui vient en contact par frottement avec une base stable (12) tandis que, lorsque l'animal est couché, le fluide contenu dans le réservoir souple (14) est réparti de telle sorte que sensiblement toutes les parties du corps de l'animal (20) soient isolées de la base (12) par le fluide contenu dans le réservoir souple (14).

**16.** Groupe formé d'une seule pièce (11) de litières (10) selon l'une quelconque des revendications précédentes, reliées les unes aux autres.

**17.** Groupe (11) de litières (10) selon la revendication 16, dans lequel la ou chaque feuille de support (12) est continue sur l'ensemble du groupe (11).

**18.** Groupe (11) de litières (11) selon la revendication 16 ou la revendication 17, dans lequel les litières (10) sont disposées côte à côte pour former une bande allongée (11).

**19.** Groupe (11) de litières (10) selon la revendication 18, contenant des litières (10) selon la revendication 2 ou l'une quelconque des revendications 3 à 14 lorsqu'elles dépendent de celle-ci, dans lequel la bande (11) peut être enroulée pour adopter une configuration relativement compacte.

**20.** Groupe (11) de litières (10) selon l'une quelconque des revendications 16 à 19, dans lequel les litières adjacentes (10) sont séparées par au moins une séparation droite (16).

**21.** Groupe (11) de litières (10) selon l'une quelconque des revendications 16 à 20, dans lequel chaque litière (10) présente une valve individuelle réglable permettant à la pression de fluide régnant à l'intérieur de son réservoir souple (14) de varier indépendamment de la pression de fluide dans les autres réservoirs souples (14) à l'intérieur du groupe (11).

**22.** Groupe (11) de litières (10) selon l'une quelconque des revendications 16 à 21, dans lequel tous les réservoirs souples (14) sont raccordés par un collecteur à une alimentation en eau commune.

**23.** Procédé pour supporter du bétail sur une litière (10) selon l'une quelconque des revendications 1 à 15 ou sur un groupe (11) de litières (10) selon l'une quelconque des revendications 16 à 22, comprenant le choix d'une pression de fluide ou d'un volume de fluide à l'intérieur du réservoir souple (14) adapté à un animal particulier (20), de telle sorte que la charge concentrée d'une patte de cet animal (20), lorsqu'il est debout, appuie sur la feuille de support (12) qui vient en contact par frottement avec une base stable (12) tandis que, lorsque l'animal (20) se couche, le fluide contenu dans le réservoir souple (14) est réparti de manière à ce que sensiblement toutes les parties du corps de l'animal (20) soient isolées de la base (12) par le fluide contenu à l'intérieur du réservoir souple (14).

**24.** Procédé selon la revendication 23, lorsqu'il s'applique à supporter une pluralité d'animaux (20) sur un groupe (11) de litière (10) selon l'une quelconque des revendications 16 à 22, comprenant le choix d'une pression de fluide différente à l'intérieur de chaque litière (10) du groupe (11).

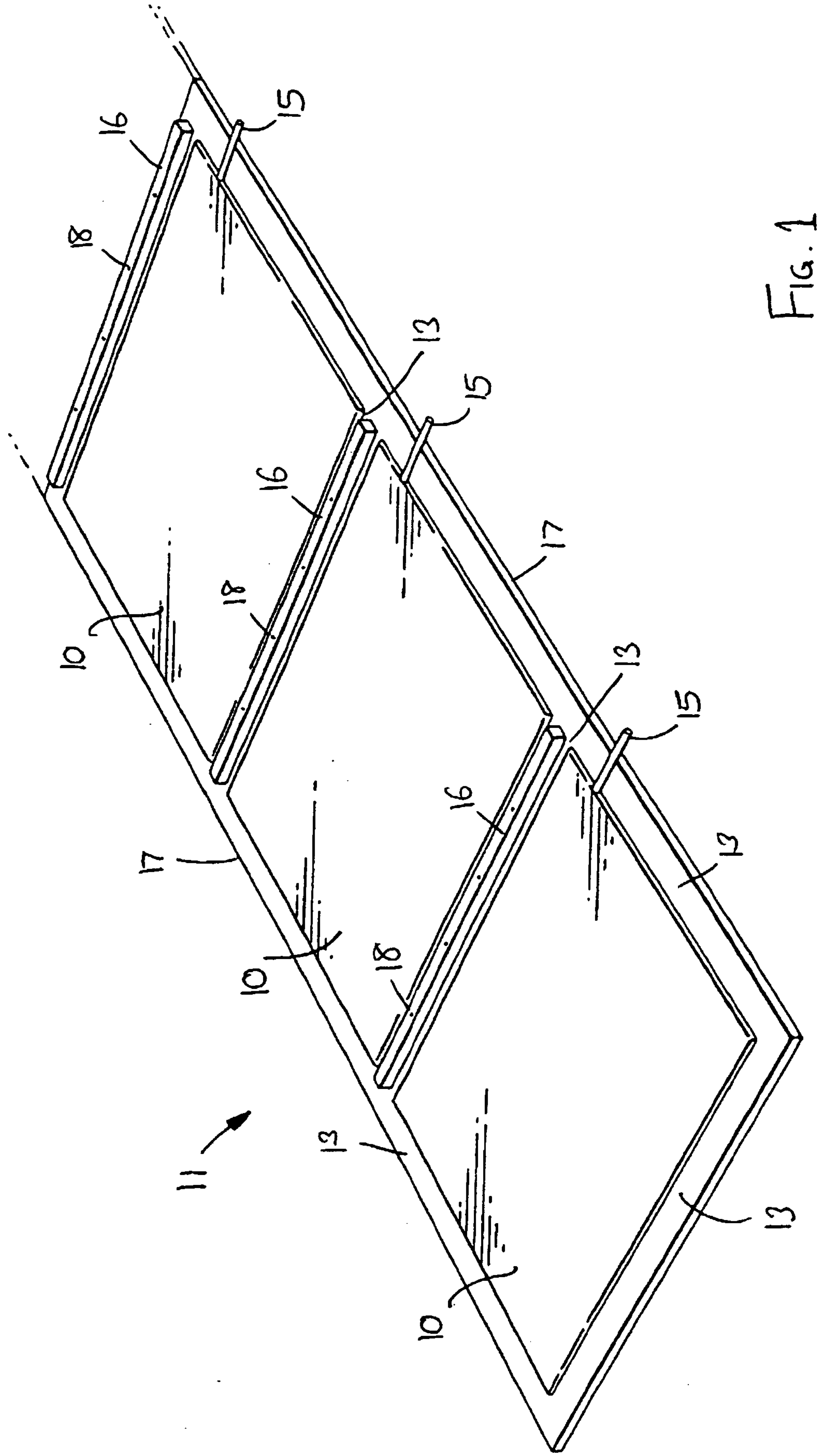

FIG. 1

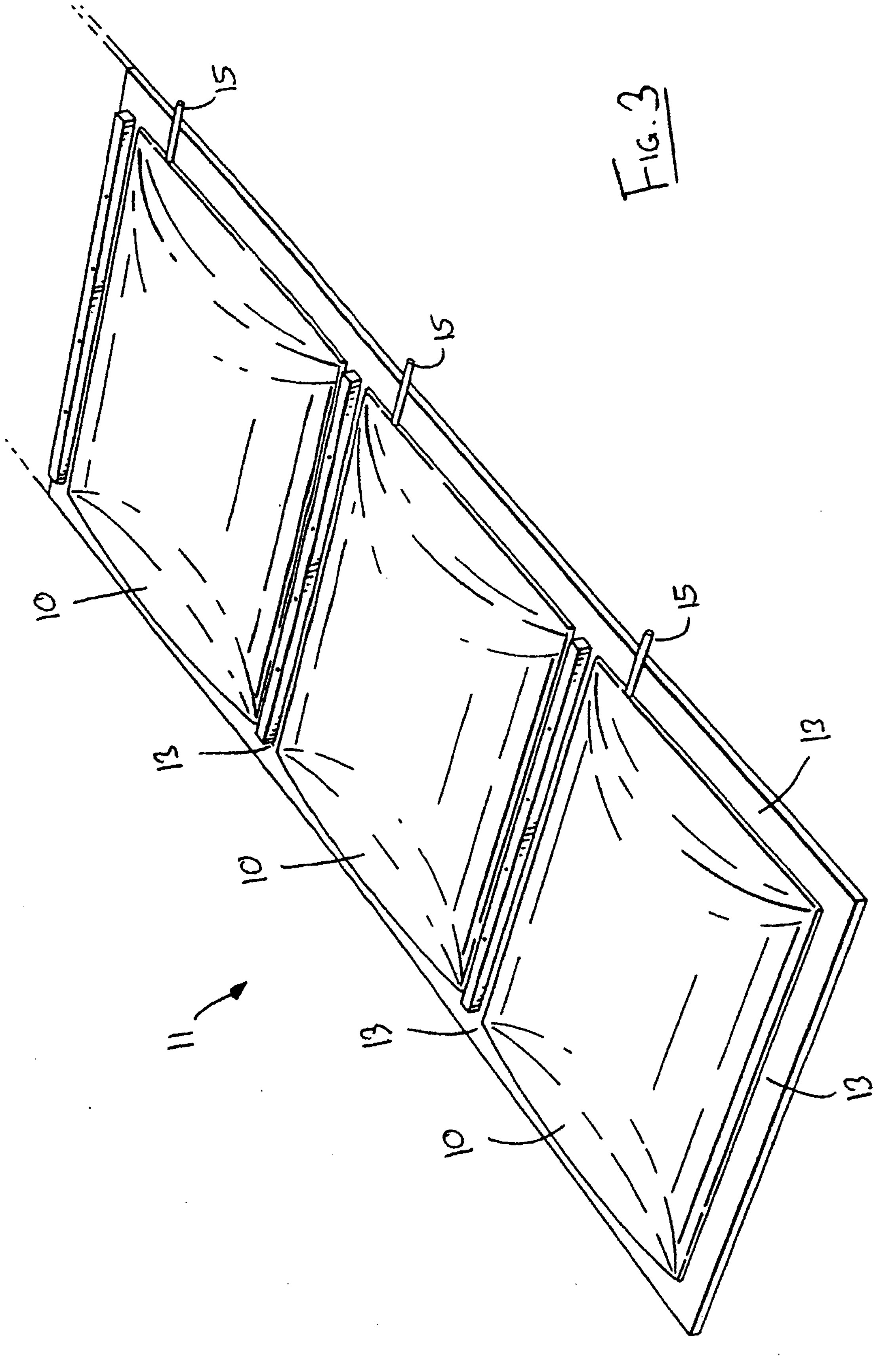

Fig. 3

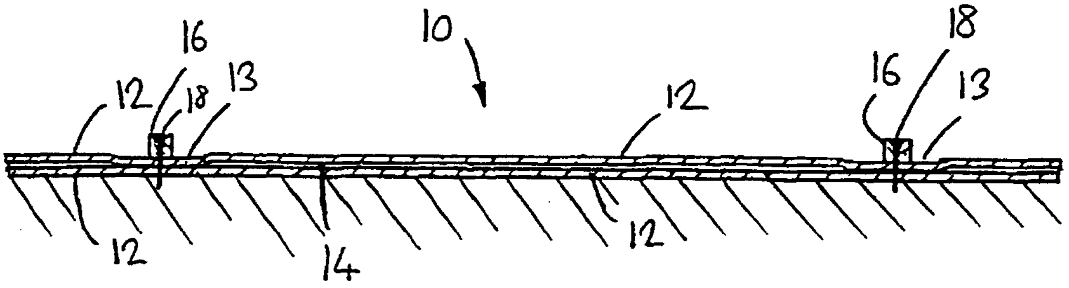

FIG. 2

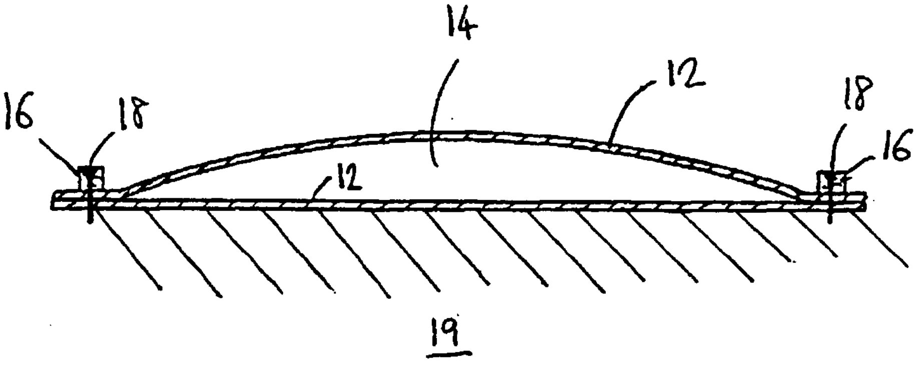

FIG. 4

Fig. 5

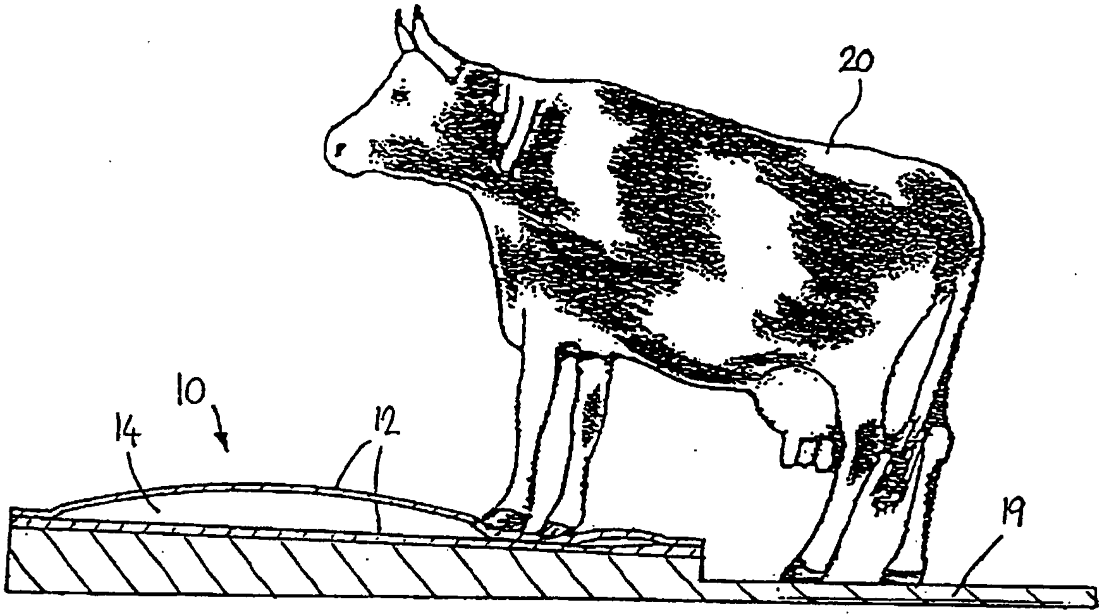

Fig. 6